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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,035	05/02/2007	Marcello De Martino	011235.57478US	9513

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EXAMINER

EASTMAN, AARON ROBERT

ART UNIT	PAPER NUMBER
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3745

MAIL DATE	DELIVERY MODE
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09/27/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,035	Applicant(s) DE MARTINO, MARCELLO	
	Examiner Aaron R. Eastman	Art Unit 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>04/14/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 10-16 are objected to because of the following informalities: In line 1 of claims 10-13, line 3 of claim 14 and line 2 of claims 15 and 16, "Claim" should read -- claim--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 9-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 4,351,532, the embodiment shown in Fig. 4 (Lavery Fig. 4 hereinafter) in view of USP 4,351,532, the embodiment shown in Fig. 5 (Lavery Fig. 5 hereinafter) and USP 5,236,302 (Weisgerber et al. hereinafter).

4. In re claim 9 Lavery Fig. 4 discloses a seal arrangement for a gas turbine for sealing a gap between a radially internally located end (26) of a guide vane (24) of a guide vane ring and a rotor (10), wherein the rotor (10) includes at least two seal projections (32, Fig. 4), positioned at an axial distance relative to each other, in a circumferential direction of the rotor, the seal projections (32) providing a seal of the gap and associated with the radially internally located end (26) of the guide vane (24), and wherein, in a space limited by the two seal projections (32), at least one recirculation structure (36) is provided and oriented toward the side of higher pressure.

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5. Lavery Fig. 4 does not disclose a turbocompressor, intake linings configured as honeycomb structures or that the seal projections are inclined in an axial direction toward a side of higher pressure.

6. Lavery Fig. 5 teaches seal projections (44) that are inclined in an axial direction toward a side of higher pressure.

7. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Lavery Fig. 4 by forming the seal projections so that they are inclined in an axial direction toward a side of higher pressure as taught in Lavery Fig. 5 for the purposes of redirecting and inhibiting leakage flow (col. 3 lines 40-47).

8. Weisgerber et al. teaches a similar seal to that of Lavery Fig. 4 and Lavery Fig. 5 as part of the compressor and turbine sections of a gas turbine engine for an aircraft (col. 1 lines 5-8). Weisgerber et al. also teaches the use of honeycomb structure (226, Fig. 9) on the radially inner end of a stator blade (224) that engage with seal teeth (228) of a rotor to form a labyrinth seal (col. 7 lines 30-40).

9. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the apparatus of Lavery Fig. 4 by using the seal in particular for an aircraft engine turbocompressor and by providing intake linings configured as honeycomb structures positioned opposite the inclined seal projections as taught in Weisgerber et al. for the purposes of increasing sealing effectiveness.

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10. In re claim 10 the Lavery Fig. 4 modification in re claim 9 discloses the seal arrangement according to claim 9, wherein the recirculation structure (36) is integrated in a radially internally located platform (26) of the guide vane (24) of the guide vane ring.

11. In re claim 11 the Lavery Fig. 4 modification in re claim 9 discloses the seal arrangement according to claim 9, wherein the seal projections (32) are configured as seal fins.

12. In re claim 12 the Lavery Fig. 4 modification in re claim 9 discloses the seal arrangement according to claim 9, wherein a honeycomb of the honeycomb structures (226 of Weisgerber et al.) is configured such it is open in a direction toward the seal projections (32).

13. In re claim 13 the Lavery Fig. 4 modification in re claim 9 discloses the seal arrangement according to claim 9, wherein the seal projections (32) and intake linings have different radii, wherein an outer radii of the seal projections (32), as well as an inner radii of the intake linings, increase in the direction toward the side of higher pressure (col. 3 lines 32-47 of Lavery disclose that leakage happens left to right in Fig.'s 4 and 5 meaning that higher pressure is on the left side).

14. In re claim 14 the Lavery Fig. 4 modification in re claim 9 discloses a turbocompressor in axial construction and/or diagonal construction and/or radial construction, comprising a seal arrangement according to claim 9.

15. In re claim 15 the Lavery Fig. 4 modification in re claim 9 discloses an aircraft engine comprising a turbocompressor according to claim 14.

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16. In re claim 16 the Lavery Fig. 4 modification in re claim 9 discloses a stationary gas turbine comprising a turbocompressor according to claim 14.

17. In re claim 17 the Lavery Fig. 4 modification in re claim 9 discloses a seal for a gas turbine, comprising:

at least two seal projections (32) disposed on a rotor (10);

at least two intake linings on a radially internal end (26) of a stationary guide vane (24), wherein the at least two intake linings are configured as honeycomb structures (226, Fig. 9 of Weisgerber et al.) and are disposed opposite the at least two seal projections (32); and

a recirculation structure (36) disposed on the radially internal end (26) of the stationary guide vane (24) and between the at least two seal projections (32) on the rotor (10).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USP's 1689735, 1756958, 1857961, 4513975, 5029876, 5118253, 5127797, 5218816, 5244216, 5281090, 5320488, 5333993, 5354174, 5749701, 5833244, 5984630, 6969239, 7241109, 7264442 and 7556474 as well as USPAP's 2004/0151582, 2006/0133928, 2008/0014077 and 2009/0129916 all disclose a labyrinth seal between rotating and non-rotating portions of a turbine engine.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron R. Eastman whose telephone number is (571)270-3132. The examiner can normally be reached on Mon-Thu 9:00-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron R. Eastman/
Examiner, Art Unit 3745

/Christopher Verdier/
Primary Examiner, Art Unit 3745